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Contributions to the Analysis of the Sensations. By Dr. ERNST MACH. Translated by C. M. WILLIAMS. Chicago, Open Court Publishing Co., 1897.—pp. ix, 208.

This translation of Mach's well-known work contains several new footnotes and two appendices: one an article on "Facts and Mental Symbols," reprinted from the *The Monist* for January, 1892; the other a description of some new acoustic apparatus. As its translator says, the matter in the book is by no means proportioned to its size. The problems which it discusses comprise some of the most important points at issue in modern psychology, and an adequate criticism of its theories would involve writing a psychological treatise.

Professor Mach's position is an interesting one. He is a man of science who has recognized the fact that states of consciousness are the only immediate objects of knowledge. From this standpoint he opposes alike the "monstrous idea" that atoms can explain psychical processes, and the popular 'monism' which regards mind and matter as opposite phases of reality. For him the world of external nature is a world of sensations. The atoms of the physicist are simply convenient mental symbols. By way of compensation for this degree of philosophic enlightenment, Professor Mach takes a purely atomistic view of mind; the so-called 'ego' is no real unity, but a mere bundle of sensations. Space and time are sensations like the rest. If two figures which are differently colored are yet recognized as similar in form, this is because they are sensation complexes containing like elements, *i.e.*, like space sensations. And these space sensations are sensations of innervation; that is, there is a direct consciousness of the amount of energy put forth in eye and other movements. Various phenomena tending to prove the existence of innervation sensations are discussed, but all of them would seem to be equally explicable on the theory now held by Wundt that the so-called innervation sensations are simply memory-images of movement sensations formerly peripherally excited. Professor Mach also believes in the existence of specific time sensations; for example, we distinguish the third bell-stroke in a series from the second because it is accompanied by a different time sensation. These time sensations are conditioned, he suggests, by progressive fatigue of the attention.

In addition to the chapters discussing these subjects, the author takes up the consideration of sensations of tone. His theory of the physiology of tone supposes that but two "specific energies," combined in varying proportions, correspond to the various audible tone-qualities. In order to explain why two tones when sounded together remain distinct, instead of fusing to a tone of intermediate pitch, we may assume a third energy, "similar to the sensation of innervation," which serves as it were to localize the tones. The discussion of consonance is too complicated to be briefly stated.

It will be seen that the book is one which, by reason both of its author's reputation and its own originality and suggestiveness, well deserved translation. But its conciseness and disconnectedness make it rather difficult reading. One often gets the impression of a series of notes made for the writer's own use, rather than of an exposition intended for the public.

MARGARET WASHBURN.

Fear. By ANGELO MOSSO. Translated from the fifth edition of the Italian by E. LOUGH and F. KIESOW. London and New York, Longmans, Green, & Co., 1896. — pp. 278.

Students of psychology in America and England are much indebted to the translators of Professor Mosso's well-known monograph. The translation before us is a very readable version of an eminently readable book. As Mosso's work is now for the first time accessible to English readers, some general remarks on its character and standpoint may not be out of place.

The author evidently intended to address himself, not merely to psychologists, but also to "those unaccustomed to scientific work," and he certainly has succeeded in stating his results in a clear and interesting manner. The work is much wider in scope than its title would indicate; it really contains, implicitly at least, a theory of 'emotional expression' in general. It brings out very clearly the direction of the advance which has been made in this field since Darwin's *Expression of the Emotions* was written. The tendency has been to lay more stress on the principle which Darwin called "The Direct Action of the Nervous System," and to allow the other principles to fall into the background. This is explicitly stated by Mosso in his Introduction. "Darwin attributed, I think, too much importance to the will considered as the cause of expression. We younger physiologists are more mechanical; we examine the organism more minutely; and it is in the structure of the organs that we seek the reasons of their functions" (p. 10). The difference cannot be better illustrated than by the instance which Mosso himself cites, namely, the explanation of blushing. In accounting for this fact Darwin maintained that, whenever we know or imagine that others are depreciating us, our attention is strongly directed to ourselves, and particularly to that part of our body in regard to which we are most sensitive, namely, the face. The result of this is that the facial nerves are affected, and, through them, the facial capillaries. Mosso, on the other hand, tells us that "emotion occasions greater energy in the chemical processes of the brain; there is a modification in the nutrition of the cells, the nervous force is more rapidly consumed, and therefore the expansion of the blood-vessels of head and brain tend, by a more abundant supply of blood, to preserve the activity of the nerve centres" (p. 18). The principle is simply that "for the maintenance of life it is necessary that a dilatation of the blood-vessels should take place in all those organs in